Fact Sheet: Recovery Potential Project

Landscape Screening Tools and Resources for Assessing the Restorability of Impaired Waters

Project Goal: Develop tools and data to help state TMDL and restoration programs decide where best to use their limited restoration resources among large numbers of impaired waters.

- Document factors relevant to recovery potential from the technical literature and practitioner insights;
- Apply these findings to develop recovery potential indicators measurable from commonly available geospatial and monitoring data;
- Develop a rapid and flexible recovery potential screening tool; and
- Demonstrate how landscape analysis techniques, EPA data systems and statewide GIS data can help states screen and compare impaired waters for recovery potential during restoration planning.

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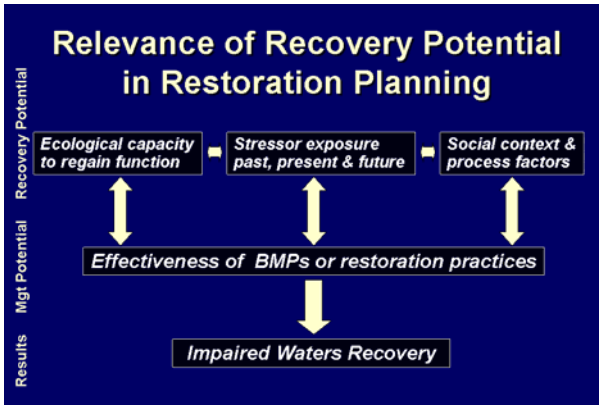


Underlying Concept: Our working definition of recovery potential is ***the likelihood of an impaired water to reattain Water Quality Standards or other valued attributes, given its ecological capacity to regain function, its exposure to stressors, and the social context affecting efforts to improve its condition*.** Funding for restoration is always limited, thus priority-setting is inevitable but difficult. Traditionally, recovery potential has not been easily factored into restoration planning at the statewide scale because of limited data and technical tools. Advances in data and GIS technology have made it feasible to perform rapid, statewide, comparative screening of large numbers of waters, using geo-spatial indicators of recovery potential selected for the place and purpose at hand. Recovery potential should be a primary consideration in restoration programs whose primary purpose is to bring about recovery. Comparative methods to aid restoration planning can lead to better restoration investments that restore valuable waters earlier, more consistently, more cost-effectively, and in more places.

Potential Applications of Recovery Potential

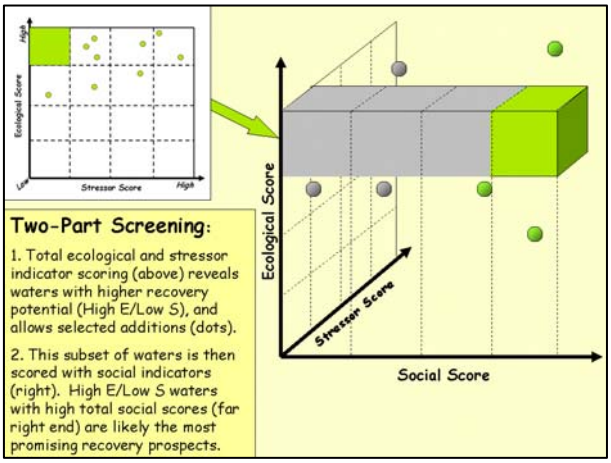
- Aid state decisions in 303(d) list scheduling for TMDL development and in planning TMDL implementation;
- Assist in restoration-related decisions regarding Clean Water Act Section 319 nonpoint source control projects as well as state-level restoration initiatives;
- Help EPA regions develop strategies to meet performance tracking measures, such as where increases in restored waters and improved watersheds can most likely be achieved;
- Assist state-level and basin-level programs that need to focus on priority places due to limited resources; and
- Reveal more about underlying factors that determine TMDL or restoration successes and use these new insights to support program decisions.

Recovery Potential Tools and Resources

Restoration and Recovery Literature Database: 1500+ published citations in a partially annotated MS Access database. Copies are open for each user's personal customizing, key wording and adding new references.

Recovery Potential Indicators: Tested over 130 metrics in three classes: ecological capacity, stressor exposure, and social context (see examples on back). The 60+ now in use have fact sheets on scientific basis and measurement.

Recovery Potential Screening Methods: Indicator-specific measurement and scoring procedures, and an overall comparative screening approach (at right).



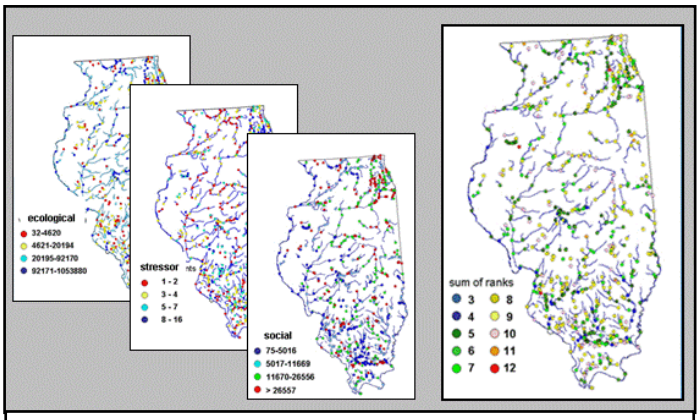
Recovery Potential User Support Website (under development): Will contain the downloadable literature database, indicator fact sheets, data source links, analysis methods and recovery screening examples.

Example Recovery Potential Indicators ***(user selects only the metrics in each class most relevant to the place and purpose of the screening)***		
Ecological Capacity Metrics	**Stressor Exposure Metrics**	**Social Context & Process Metrics**
natural channel form	invasive species risk	watershed % protected land
recolonization access	channelization	applicable regulation
Strahler stream order	hydrologic alteration	funding eligibility
rare taxa presence	aquatic barriers	303(d) schedule priority
historical species occurrence	corridor road crossings	estimated restoration cost
species range factor	corridor road density	certainty of causal linkages
elevation	corridor % U-index	TMDL or other plan existence
corridor % forest	corridor % agriculture	university proximity
corridor % woody vegetation	corridor % urban	certainty of restoration practices
corridor slope	corridor % impervious surface	watershed organizational leadership
bank stability/soils	watershed % U index	watershed collaboration
bank stability/woody vegetation	watershed road density	large watershed management potential
watershed shape	watershed % agriculture	government agency involvement
watershed size	watershed % tile-drained cropland	local socio-economic stress
watershed % forest	watershed % urban	landownership complexity
proximity to green infrastructure hub	watershed % impervious surface	jurisdictional complexity
contiguity w/green infrastructure corridor	severity of 303(d) listed causes	valued ecological attribute
biotic community integrity	severity of loading	human health and safety
soil resilience properties	past land use change trajectory	recreational resource

State and Regional Scale Demonstration Projects

Illinois Pilot Study:

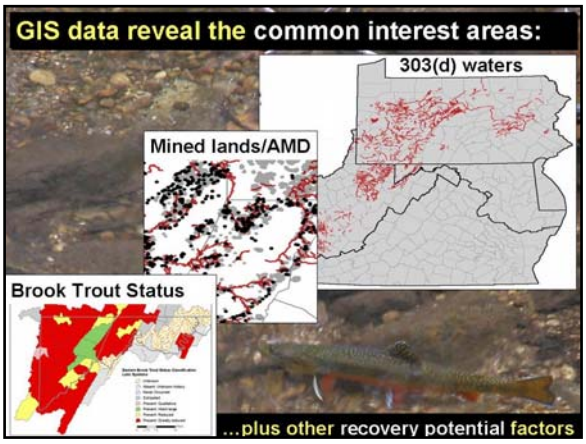
- screened the recovery potential of 723 Illinois 303(d)-listed waters in a statewide comparison
- developed, measured and mapped 104 ecological, stressor and social indicators
- provided first 'proof of concept' demonstration of indicators and methods for screening



Example statewide recovery potential maps for ecological, stressor, and social metrics, and a final sum of ranks map.

Maryland Watershed Screening (ongoing)

- screening recovery potential at small watershed scale to aid restoration strategies
- comparing impaired and unimpaired watersheds
- exploring integration of recovery potential concepts with bioassessment and Stressor Identification



EPA Region 3 Native Fisheries Recovery Screening

- screening in four states to identify high potential native fish habitat restorations of interest to three key programs (303(d), abandoned minelands, fisheries restoration)
- focused approach, less than ten indicators
- demonstrated that very rapid statewide recovery screenings to address specific issues are feasible
- stimulated cross-program collaborations and additional screening at state level in Pennsylvania

Contacts

- Doug Norton, EPA Office of Water, Project Co-Manager: norton.douglas@epa.gov Project design, recovery literature synthesis, indicator development, application of recovery potential concept to water programs
- Jim Wickham, EPA Office of Research and Development, Project Co-Manager: wickham.james@epa.gov Development and application of landscape indicators mapping, measurement, datasets and database design